

**IN THE UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF NEW YORK**

PRINCETON DIGITAL IMAGE CORPORATION,

PLAINTIFF,

v.

HEWLETT-PACKARD COMPANY, FUJIFILM  
NORTH AMERICA CORPORATION F/K/A  
FUJIFILM U.S.A., INC. AND XEROX  
INTERNATIONAL PARTNERS,

DEFENDANTS.

CASE NO.: 1:12-CV-00779-RJS

**PLAINTIFF'S OPENING CLAIM CONSTRUCTION BRIEF**

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## **I. BACKGROUND OF THE TECHNOLOGY**

### **A. U.S. Patent No. 4,813,056 (the “’056 Patent”)**

Long before it became the norm for every household to have a computer, a mobile phone and a digital camera, Nicola Fedele invented a new digital signal encoding scheme that increased the extent by which large amounts of digital information could be compressed in size. Mr. Fedele was a visionary. His invention has facilitated the success of today’s information age where paper is disappearing, the instantaneous exchange of large amounts of data is expected, social media communications are rampant, and the world generally depends on digital devices to transmit and receive data for business and entertainment.

Mr. Fedele filed a patent application for his invention in 1987, and it issued as the ‘056 Patent, which is entitled “Modified Statistical Coding of Digital Signals.” The invention described in the ‘056 Patent is directed to encoding digital signals using a coding rule that considers how frequently certain information contained in the signal occurs. 1:5-8<sup>1</sup>. Mr. Fedele’s invention is particularly useful for compressing image information, such as video. 1:67-2:14.

Compression of information requires representation of the information in a more efficient manner. 2:52-56. The ‘056 Patent accomplishes this task by using an encoding scheme where digital codewords are used to represent various different types of information or conditions in the signal based on the conditions’ frequencies of occurrence. Because the goal is compression, the ‘056 Patent focuses on coding techniques that minimize the size—or length—of the digital codewords and, thus, the amount of data that represents the information in the signal. 2:56-60.

As the title of the patent implies, Mr. Fedele’s invention is a modification—and improvement—of statistical coding techniques that were then known. “Statistical coding” uses

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<sup>1</sup> All citations of the form COLUMN:LINE or COLUMN:STARTLINE-ENDLINE in Secs. I.A and III.A of this Brief are with respect to the ‘056 Patent.

digital codewords of variable bit lengths to represent information in a signal, where the lengths of the codewords are inversely related to how frequently the codewords are used. 1:49-54. Thus, when used to encode a signal, the codewords that are assigned to types of information (or conditions) that are more likely to occur in the signal are shorter than codewords that are assigned to conditions that are less likely to occur. However, statistical coding still leaves room for improvement. For instance, when a signal manifests a very large number of conditions that need to be encoded, a corresponding large number of codewords are required, resulting in codewords having relatively long lengths even under a statistical coding scheme. 5:51-60.

A condition can correspond to many different types of information or characteristics of a signal, depending on the type of signal being encoded. For instance, video information contained in a digitized signal can be represented by sequences of numbers that have either zero or non-zero values. Numbers having the same value may occur in succession, which is referred to as a “run.” 1:56-61; 2:3. Runs may have a length, where the length corresponds to a count of the successive identical numbers in the run. *Id.* Thus, a condition can be a state manifested in the signal (*e.g.*, a run of successive numbers of the same value), a value present in the signal (*e.g.*, the value of a non-zero or zero number; the value of the length of a run), or any other condition of the signal that is useful to describe the information. 2:65-3:1; 18:14-19.

The ‘056 Patent describes an exemplary application of its encoding scheme to one type of signal in particular—a video signal. A video signal can include a large number of conditions. In the described example, the video signal represents 240 pixels and has over 240 possible conditions. 2:3-14. If a statistical coding rule is used, the conditions which occur less frequently will be assigned very long codewords, which detracts from the degree to which the information can be compressed by encoding. To address this issue, the ‘056 Patent maintains two groups of

codewords that are treated differently in the encoding scheme. The codewords that are designated as members of the first group are assigned to conditions that occur more frequently in the video signal (*i.e.*, have a higher probability of occurrence) than conditions that are assigned to codewords that are designated as members of the second group. 2:61-3:12.

The '056 Patent's principle of designating codewords as members of first and second groups generally can be seen, in part, in Figure 4, which graphically shows the probabilities of occurrence of different zero run length values in a video signal. Because the video signal in the example represents 240 pixels, there can be anywhere between 1 and 240 consecutive zero values and, thus, 240 possible zero run length conditions. In this example, zero run lengths having values in the range from 1-35 are more probable to occur in a given signal than zero run lengths having values of 36-239 (with the zero run length value of 240 representing a special case). In the described embodiment, members of the first group include the codewords that are assigned to the more likely to occur zero run lengths values 1-35. Members of the second group include the codewords assigned to zero run length values 36-239, which occur less frequently.

A codeword's designation as a member of a group indicates the manner in which that codeword is treated in the encoding scheme. In the described embodiment, a statistical rule applies to the members of the first group (*i.e.*, the codeword lengths are inversely related to their probabilities of occurrence). A modified statistical rule applies to the members of the second group, where each codeword includes a common codeword segment (*e.g.*, bits referred to as a "keyword" prefix) and a suffix codeword segment. 2:61-3:27; 10:13-15; 10:48-50.

According to this modified statistical rule, the common keyword is a codeword obtained using the first group's statistical rule. Its length is based on the probability that any codeword of the second group will occur relative to the individual members of the first group. *Id.* at 3:15-20.

This probability is referred to as the “combined” or “group” probability of the second group. Table V provides an illustrative example, showing that the group probability (“keyword”) is tenth in position relative to the individual probabilities of the members of the first group.

Further according to the modified coding rule, statistical coding is not applied to the suffix portion of the codewords in the second group. *See* 10:32-45. Instead, the suffix portion can be any type of codeword that is assigned to the less frequently occurring conditions. In this example, the suffix codewords for the codewords in the second group all have the same length, although a uniform length for all suffix codewords is not a requirement. 3:24-27. Regardless the length of the suffix, the total length of the combined prefix and suffix—*i.e.*, the length of the overall codeword—is ***not*** determined by applying the first group’s statistical rule. *See* 3:20-27.

This modified statistical coding rule, which considers a group probability of occurrence, generally results in codewords in the second group that have shorter lengths than if statistical coding were used. *Id.* Because the group probability is higher than the probability that any individual member of the second group will occur, the prefix codeword that is assigned to group members is shorter than the codewords that would have been assigned if statistical coding had been used. *See* 14:19-36. When the prefix codeword is combined with the suffix codeword to form the overall codeword for a condition, the length of each overall codeword in the second group will usually be shorter than if only unmodified statistical had been used. *Id.*

**B. U.S. Patent No. 4,860,103 (the “‘103 Patent”)**

Mr. Fedele was not the only visionary. Today’s digital cameras benefit from the invention that is described and claimed in the ‘103 Patent even though it, like the invention of the ‘056 Patent, was set forth in an application that issued many years ago. Although not so limited, the ‘103 Patent solves a problem that is often encountered when trying to capture an image—

controlling picture quality even in extreme or poor ambient lighting conditions. *See* 3:27-35<sup>2</sup>. The invention performs this function by taking digital samples of a video signal and then automatically adjusting the gain or sensitivity of a circuit that converts the analog version of the video signal into a digital representation. *See* Abstract, 2:19-21; 1:39-41. This sensitivity adjustment compensates for variations in the video signal that may otherwise result in overexposure or underexposure conditions in the digital image. *See* 2:19-21.

## II. LEGAL PRINCIPLES

### A. General Principles of Claim Construction

Claim construction is a question of law exclusively for the court. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 971–72 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996). “Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005) (en banc) (citations omitted). Accordingly, the correct construction will be the one that “stays true to the claim language and most naturally aligns with the patent’s description of the invention.” *Id.*

To construe disputed terms, a court looks first to the claim language, for “[i]t is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Id.* at 1312. Generally, the words of a claim should be given their “ordinary and customary meaning,” which is “the meaning that the term[s] would have to a person of ordinary skill in the art in question at the time of the invention.” *Id.* at 1313.

In many cases, the meaning of a term to a person skilled in the art will not be immediately apparent, and a court must turn to other sources to determine the term’s meaning,

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<sup>2</sup> All citations of the form COLUMN:LINE or COLUMN:STARTLINE-ENDLINE in Secs. I.B and III.B of this Brief are with respect to the ‘103 Patent.

including “the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.” *Id.* at 1314.

Courts should also consider the context in which the term is used in an asserted claim or in related claims in the patent, bearing in mind that “the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.* at 1313. Indeed, the specification “is always highly relevant to the claim construction analysis” and “[u]sually...dispositive; it is the single best guide to the meaning of a disputed term.” *Id.* at 1315 (internal quotes omitted). Where the specification reveals that the patentee has given a special definition to a claim term that differs from the meaning it would ordinarily possess, “the inventor’s lexicography governs.” *Id.* at 1316. However, where the claim language supports a broad scope, the claims are not limited to the disclosed embodiments. *Phillips*, 415 F.3d at 1323. The patent’s prosecution history is also relevant to the extent it “demonstrat[es] how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution.” *Id.* at 1317.

Finally, courts may consider extrinsic evidence such as “expert and inventor testimony, dictionaries, and learned treatises.” *Id.* (citing *Markman*, 52 F.3d at 980). Such evidence, however, is “less reliable than the patent and its prosecution history in determining how to read claim terms,” and is therefore “less significant than the intrinsic record.” *Id.* at 1317-18.

## **B. Means-Plus-Function Claims**

A patentee may claim an element of the invention in terms of the element’s function, without reciting corresponding structure in the claim itself. 35 U.S.C. § 112, ¶ 6. Construction of a means-plus-function limitation requires the court to (a) determine the claimed function and (b)

“identify the corresponding structure in the written description of the patent that performs the function.” *Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1311 (Fed. Cir. 2012). “A structure disclosed in the specification qualifies as a ‘corresponding structure’ if the specification or the prosecution history clearly links or associates that structure to the function recited in the claim.” *Id.* (citation omitted).

**C. Indefiniteness Under 35 U.S.C. § 112, ¶ 2**

A claim is indefinite only if the court determines that it is not amenable to construction and is “insolubly ambiguous.” *Novo Indus., L.P. v. Micro Molds Corp.*, 350 F.3d 1348, 1353, 1358 (Fed. Cir. 2003). A claim is considered “insolubly ambiguous” when the claim language, the specification, and the prosecution history fail to provide any guidance as to what one of skill in the art would interpret the claim to require. *Honeywell Int’l, Inc., v. ITC*, 341 F.3d 1332, 1338 (Fed. Cir. 2003). The party asserting that a claim is indefinite must do so by clear and convincing evidence. *Exxon Research & Eng’g Co. v. United States*, 265 F.3d 1371, 1376 (Fed. Cir. 2001).

**III. DISPUTED TERMS**

The parties’ respective constructions for the disputed terms are set forth in Exhibit A to the Joint Claim Construction Statement (“JCCS”) (D.I. 305), which is attached as Ex. 1.

**A. The ‘056 Patent**

**1. Preambles—(JCCS Term 1 (Claim 13); Term 15 (Claim 14); Term 23 (Claim 18); Term 31 (Claim 21))**

A preamble generally is not a claim limitation. Indeed, language in a preamble is deemed limiting only if “necessary to give life, meaning, and vitality to the claim.” *Deere & Co. v. Bush Hog, LLC*, 703 F.3d 1349, 1357 (Fed. Cir. 2012) (internal citations omitted). The preamble is not limiting where the body of the claim describes “a structurally complete invention.” *Id.* at 1358. In such case, the preamble “‘merely gives a name’ to the invention, extols its features or benefits,

or describes a use for the invention.” *Id.* (quoting *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 809 (Fed. Cir. 2002)).

The term “statistical encoder” in claim 13 is merely a name for the invention, describing its possible use. The term does not add structure or limitations that are needed to complete the invention set forth in the claim body. With respect to the phrase “for encoding a digitized signal for transmission over a channel,” this phrase does not limit the scope of the claims, because it again merely expresses a possible use, and the bodies of the claims are complete without it. *See Catalina*, 289 F.3d at 809 (“the inventor of a machine is entitled to the benefit of all uses to which it can be put”). A “channel” is not an element included in the body of the any of the claims. None of the claims require that an encoded signal be transmitted anywhere.

The term “a digitized signal” is limiting, but only because it provides antecedent basis for a term that is first referred to in the claim body using “said.” Thus, “said signal” in the body of the claims is a “digitized” signal (claims 13, 14, 18 and 21). However, the language in the preambles that refers to “a different frequency of occurrence” (claim 13), “a given frequency of occurrence” (claims 14 and 21), and “a given probability of occurrence” (claim 18) is not limiting because such language neither provides antecedent basis for a limitation in the claim body nor is required to complete the claimed invention. Namely, the body of claim 13 does not refer to a “frequency of occurrence” at all. To the extent that a frequency or probability of occurrence is relevant to other claims, any needed limitations are set forth in the claim bodies. *See* Claims 14, 18 & 21 (*e.g.*, “first range of frequencies of occurrence”; “a combined frequency of occurrence”; “greatest probability of occurrence”; “lowest probability of occurrence”).

The preamble language referring to “conditions” (claims 13, 14 and 18) and “values” (claim 21) also is not limiting because, where needed, those terms are introduced in the bodies of

the claims. For instance, the body of claim 13 does not refer to “conditions” and is structurally complete without using “conditions.” The body of claim 18 does not refer to “conditions,” but instead separately introduces “a different signal value.” While the terms do appear in the bodies of claims 14 and 21, they are introduced in the bodies, so that the claims recite complete inventions without the preambles. *See* Claim 14 (e.g., “a first plurality of signal conditions”; “a different condition”); Claim 21 (e.g., “a first plurality of signal values”; “a different value”).

**2. “condition[s]” / “signal condition[s]” / “signal value[s]” / “values of said signals”—**  
(JCCS Term 2 (Claims 13, 14, 18, 21); Term 3 (Claims 13, 14, 18, 21))

PDIC’s construction of these terms follows their express definition in the specification:

In the claims, the term “value” and “condition” are intended to represent different conditions or states of the signal. ... “value” or “condition” can represent zero or non-zero values, or run length magnitudes or, for example, different zero or non-zero run lengths or other conditions manifested by a given signal.

18:14-19. The specification further states:

each codeword represents a different signal condition in an information signal. These signal conditions may, for example , be description of (a) non-zero values of the information signal ..., and (b) of more frequently encountered run lengths of zero value of the information signal.

2:63-3:1. Thus, “condition” and “value” are used interchangeably in the patent. Either term can be a value or a state or any other condition that is manifested in the signal.

Defendants ignore this definition and add a limiting modifier (*i.e.*, “one unique”) that is not supported by the intrinsic evidence. Defendants’ additional language is not helpful to a jury, and its inclusion in the construction is confusing. *See Stanacard LLC v. Rebtel Networks, AB*, 680 F. Supp. 2d 483, 493 (S.D.N.Y. 2010) (rejecting construction which “serves only to introduce additional terms into the claim and would result in confusion for the jury”). To the extent that limitations on any of the “condition” or “value” terms are required, those limitations are provided by the claim language. *See, e.g.*, claim 14 (“a first plurality of codewords

representing a first plurality of signal conditions, each codeword representing a different condition”); claim 18 (“each codeword representing a different signal value”); claim 21 (“each codeword representing a different value”).

**3. “codeword[s]” / “word[s]”—(JCCS Term 5 (Claims 13, 14, 18, 21), Term 6 (claims 13, 14, 18, 20, 21, 23))**

The “codeword” terms do not require construction because “codeword[s]” and “word[s]” have an ordinary meaning to the skilled person that is consistent with the terms’ everyday use. A jury would understand this meaning and would know from their own experience (*e.g.*, Morse code, games and puzzles, movies, etc.) that codewords are used to represent other information. *See* Ex. 7, Declaration of Joseph C. McAlexander III, at ¶ 18. The jury would also understand the terms in the context of the ‘056 Patent, which describes an encoding scheme for compressing an information signal by using codewords to represent conditions of that signal and, thus, would understand what the claims cover. *Power-One, Inc. v. Artesyn Technologies, Inc.*, 599 F.3d 1343, 1348 (Fed. Cir. 2010); *Encap LLC v. Oldcastle Retail, Inc.*, No. 11-cv-808, 2012 U.S. Dist. LEXIS 84472, at \*22 (E.D. Wis. June 19, 2012) (“Claim construction is not intended to allow for needless substitution of more complicated language for terms easily understood by a lay jury.”).

Defendants’ construction departs from the ordinary meaning and narrows the claim scope in a manner that is inconsistent with the invention. In fact, by requiring that a codeword be an “indivisible unit ... representing one unique state of a signal,” Defendants inappropriately exclude the exemplary embodiment of the invention described in the specification. *See Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1383 (Fed. Cir. 2008).

The described embodiment includes a group of codewords that each includes a common codeword portion and a suffix codeword portion. This common portion is a “special” codeword having a length determined by the statistical rule. 9:68. The suffix portion is a codeword that is

assigned, for example, to a zero run length value. 10:32-36; *see also* Sec. III.A.9 (Term 14) *infra*. Thus, the codewords in the second set are divisible into a common codeword portion and a suffix codeword portion, which themselves are codewords. Defendants err because they exclude this embodiment by use of the term “indivisible unit.”

Further, by requiring a codeword to “represent *one unique state* of the signal,” Defendants import limitations that conflict with the express limitations that are in the claims. The specification discloses that codewords represent *conditions* of the signal and that a condition can be a *state or a value*. Moreover, each claim is explicit about what the codewords represent in the context of that claim, none of which refer to “one unique state of a signal.” *See, e.g.*, claim 13, (the first set of codewords “each representing more commonly occurring zero run length values and non-zero values”); claim 14 (“a first plurality of codewords representing a first plurality of signal conditions”); claim 18 (“each codeword represent[s] a different signal value”); claim 21 (“a first plurality of codewords representing a first plurality of signal values”). The jury will understand the ordinary meanings of these terms without a construction.

4. **“first means responsive to said signal for generating a first set of codewords, each representing more commonly occurring zero run length values and non-zero values; the codewords having lengths according to a statistical rule such that the at least generally less commonly occurring words are longest and the at least commonly occurring words are shortest”—(JCCS Term 4, Claim 13)**

The parties agree that this term is governed by § 112, ¶ 6, but disagree regarding the identification of the function, the meaning of the function, and the corresponding structure.<sup>3</sup>

Identifying the function of a means-plus-function term entails differentiating between language that defines the function and language that defines other limitations in the claim. *See Lockheed Martin Corp. v. Space Sys./Loral, Inc.*, 324 F.3d 1308, 1319 (Fed. Cir. 2003); *King*

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<sup>3</sup> PDIC’s arguments and constructions of the other phrases within Term 4 are set forth in Sec. III.A.3(Terms 5, 6), Sec. III.A.5 (Term 9) and Sec. III.A.6 (Term 10).

*Pharmaceuticals, Inc. v. Purdue Pharma L.P.*, 718 F. Supp. 2d 703, 712 (W.D. Va. 2010). Here, the function performed by the “first means” is “generating a first set of codewords.” The extra language that Defendants add to this function has nothing to do with the function of generating codewords. The extra language is not even a function (or an action), but instead describes pre-existing structure of the codewords. The function of generating the codewords does not create the structure set forth in the claim; it simply outputs codewords that already have that structure. *Lockheed Martin*, 324 F.3d at 1319 (language “that merely states the result of the limitations in the claims adds nothing to the substance of the claim”). *See also* Ex. 7 at ¶ 22.

The function of “generating a first set of codewords” should be construed as “outputting a first set of codewords.” This construction is consistent with the invention of the ‘056 Patent, which concerns encoding a digitized signal using codewords that have previously been assigned to a set of possible signal conditions. The ‘056 Patent discloses that encoder 28 “generate[s] variable length codewords” that are selected from a set of codewords that previously have been assigned to signal conditions and stored in memory 200. 4:21-22. Codewords are stored in memory 200 for “transmission purposes.” 6:5-10.

Defendants’ construction of “generating” is flawed, because it does not capture the invention of the ‘056 Patent and is contrary to the intrinsic evidence. In Defendants’ view, claim 13 is directed toward creating codewords in memory as part of the encoding process. However, given the context of the ‘056 Patent discussed above, the skilled person would have understood that a means for “generating a first set of codewords” would not create those codewords and store them in memory in response to a signal, but would instead output existing codewords in such a manner as to encode the signal conditions. *See* Ex. 7 at ¶ 22.

Defendants' construction itself identifies the flaw in Defendants' interpretation of "generating." Namely, Defendants' contend that the specification does not disclose any structure corresponding to the function of "generating" when "generating" is construed to mean "creating in memory." However, the lack of corresponding structure in the specification is not a defect with the claims, but instead is the result of Defendants' faulty construction of "generating." When a claim is amenable to a valid construction, the claim should not be construed in a manner that renders it indefinite. *Biosig Instr., Inc. v. Nautilus, Inc.*, 715 F.3d 891, 898 (Fed. Cir. 2013). For this reason alone, the Court should decline to adopt Defendants' construction.

The flaw in Defendants' construction is further evident by the fact that, in the exemplary embodiment of the invention described in the '056 Patent, the codewords are stored in a memory 200 which is of the read-only type (*i.e.*, a "ROM"). Consequently, no new data can be written into memory 200 once it has been initialized with the codewords to be used in the encoding scheme, thus foreclosing Defendants' notion of creating codewords in memory as part of the encoding process. 6:3-5, 11:5-28. Given this context, "generating codewords" cannot mean "creating codewords in memory," as Defendants contend. *See also* Ex. 7 at ¶ 22.

With respect to the structure that corresponds to the recited function, the structure that the '056 Patent clearly links to outputting codewords is the memory 200 and its internal related circuitry for accessing the stored codewords. *See Intel Corp. v. VIA Techs., Inc.*, 319 F.3d 1357, 1365-66 (Fed. Cir. 2003) (holding that internal circuitry of an electronic device need not be disclosed in the specification if one of skill in the art would understand how to build and modify the device); Ex. 2, MCGRAW HILL DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS, at 994 (memory, memory cell); Ex. 3, ELECTRICAL ENGINEER'S REFERENCE BOOK, at 25/14-25/16; Ex. 7 at ¶ 24. Memory 200 outputs the codewords for transmission to a receiver. 6:5-10. Address

signals are provided to the memory 200, and memory 200 selects the corresponding stored codewords for output to encode the conditions of the digitized signal. 12:57-64. The memory 200, which contains the storage elements and related circuitry to access the storage elements, thus completely performs the function of outputting codewords.

Anticipating that the Court will reject their construction of “generating,” Defendants have identified structure that they purport performs the function of “outputting” codewords. However, Defendants’ structure (*i.e.*, sections 501 and 502 of ROM 200, registers 202, 206, the logic gates 208-226, the counter 228, and the switch 230) does not perform the function of outputting codewords. While these structures (and others) may enable the function to occur, they do not perform the function of generating codewords itself. *See* Ex. 7 at ¶ 24; *Asyst Techs., Inc. v. Empak, Inc.*, 268 F.3d 1364, 1371 (Fed. Cir. 2001) (structure enabling device to work is not included in the corresponding structure if it does not “actually perform” the claimed function).

Claim 1 is instructive. *Hologic, Inc. v. SenoRx, Inc.*, 639 F.3d 1329, 1336 (Fed. Cir. 2011) (other claims “can also be a valuable source of enlightenment as to the meaning of a claim,” even when the other claims do not depend from the claim at issue). Like claim 13, claim 1 recites first and second means for generating codewords. But unlike claim 13, claim 1 also requires “a third means for **causing** said codewords of said first and second set to be generated,” an additional limitation that would encompass structures for addressing and controlling the operation of the memory (*e.g.*, registers, logic gates, counters, switches) that enable the function of outputting codewords to occur. The recitation of this structure in claim 1 as a separate limitation (which, like claim 13, requires “means for generating”) indicates that the patent drafter did not intend the “means for generating” itself to include addressing and controlling structures.

5. **“more commonly occurring zero run length values and non-zero values”**—(JCCS Term 9 (Claim 13))

This phrase is not indefinite,<sup>4</sup> and PDIC's construction should be adopted:

“conditions that correspond to zero run length values and non-zero values that generally occur more commonly than conditions represented by codewords in a second set of codewords”

Ex. 1 at 18. PDIC's construction aligns with the intrinsic record. The '056 Patent generally is concerned with statistical coding, which involves determining how commonly conditions of a signal occur and then assigning codewords based on that determination. 1:49-54; Ex. 7 at ¶ 10. The particular coding scheme disclosed in the '056 Patent treats two sets of codewords in different manners. For a given set of conditions, the more commonly occurring conditions are assigned to codewords in a first subset. The other, less commonly occurring conditions are assigned to codewords in a second subset. The specification is clear that conditions of a signal that are assigned to codewords can encompass any of a variety of attributes of the signal, including values, states, or anything else. The specification also is clear that a goal of the coding scheme is to minimize the length of codewords. The inventive coding scheme accomplishes this goal by treating less frequently occurring conditions differently than more frequently occurring conditions, without regard to the particular type of condition.

Given this context, “more commonly occurring zero run length values and non-zero values” in claim 13 are the conditions assigned to the codewords in the first set, and these conditions occur more commonly than conditions assigned to codewords in the second set. *Biosig Instr.*, 715 F.3d at 898 (claims that are amenable to construction are not indefinite).

6. **“a statistical rule such that the at least generally less commonly occurring words are longest and the at least generally most commonly occurring words are shortest”—**  
(JCCS Term 10 (Claim 13))

The meaning of this phrase is readily understood in the context of the '056 Patent without

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<sup>4</sup> Defendants have not provided the basis for their contention that this phrase is indefinite. PDIC will provide a rebuttal to Defendants' specific arguments if Defendants do provide such a basis.

a construction by the Court. The specification describes statistical coding as a technique that uses “codewords of variable bit length, which are chosen so their length is inversely related to the frequency that ... they ... tend to be selected.” 1:50-54. Exemplary codewords obtained from a statistical coding rule are illustrated in statistical order in Table V (8:15-9:17), showing that the at least generally most commonly occurring words are shortest and the at least generally less commonly occurring words are longest. In Table V, multiple codewords have the same length of 10 bits, although their individual probabilities of occurrence are not the same. The presence of multiple codewords having the same length illustrates that the “at least generally less commonly occurring” codewords have the longest length.

Defendants’ construction<sup>5</sup> errs by creating ambiguity by substituting the word “imprecise” for “statistical.” The ‘056 Patent is directed to a modified statistical coding scheme where codewords are assigned to conditions in accordance with defined rules. That one of the rules is a statistical rule based on probabilities does not mean that the rule is “imprecise.”

7. **“second means responsive to said signal for generating a second set of codewords, each word of said second set of words representing less commonly occurring zero run length values, the codewords of the second set each comprising the same prefix keyword code having a length assigned according to the statistical rule with said first set of codewords and a suffix of such length that the prefix and suffix together have length outside said statistical rule”—(JCCS Term 11 (Claim 13))**

The parties agree that this term is governed by § 112, ¶ 6, but disagree regarding the identification of the function, the meaning of the function, and the corresponding structure. The core disputes on this phrase include the disputes discussed above in Section III.A.4 *supra*.<sup>6</sup>

For the reasons set forth above, the function performed by the second means is

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<sup>5</sup> Defendants alternatively contend that this term is indefinite, but have not yet provided the basis for their contention. PDIC will provide a rebuttal if Defendants do provide such a basis.

<sup>6</sup> PDIC’s arguments and constructions of other phrases within Term 11 are set forth in Sec. III.A.8 (Term 12) and Sec. III.A.9 (Term 14).

“generating a second set of codewords.” The remaining non-functional language of the phrase are limitations on the structure of the codewords that are output as a result of the generating function. Also as discussed above, the “generating” function should be construed as “outputting a second set of codewords,” and the corresponding structure is the memory 200, including its storage elements and output circuitry to access those elements.

Here again, Defendants contend that the specification does not disclose structure linked to “generating codewords.” As discussed above, Defendants arrive at this conclusion by offering an erroneous construction which asserts that “generating” means “creating in memory.” Defendants’ proposed construction is wrong for the reasons discussed above in Section III.A.4.

Anticipating that the Court will reject their construction of “generating,” Defendants have identified structure that they purport performs the function of “outputting” codewords. However, by identifying (1) section 502 of memory 200, (2) registers 202 and 206, (3) counter 228, (4) switch 230, and (5) logic gates 208-226, Defendants have included structure that does not perform the function of outputting codewords. *See* Ex. 7 at ¶ 28. While other structures that address and control the operation of the memory may enable the “generating” function to occur, they do not perform the function of generating codewords itself. *See id.*; Sec. III.A.4 *supra*.

#### 8. “prefix keyword code”—(JCCS Term 12 (Claim 13))

PDIC’s construction (*i.e.*, “special code that is the initial portion of a codeword”) is consistent with the specification. *See* 9:67-10:2 (“The term keyword as used herein implies that a ***special code*** is employed for each zero run length value for all members of the group in portion p1 of the curve p”) (emphasis added), 10:4-16 (“a Huffman code comprising an n-bit codeword segment...is assigned as the ***initial or prefix portion*** of all members of the group under segment curve portion p1.... This n-bit code is termed ***keyword***”) (emphasis added).

None of the various parts of Defendant’s construction is supported by the specification,

including (a) “not a codeword”; (b) “indicates that what follows”; and (c) “is to be treated as a suffix as opposed to a codeword.” First, the terms “code” and “codeword” are repeatedly used interchangeably throughout the specification. For instance, Table V lists codewords in a righthand column that is labeled “Code.” The list of codewords in Table V includes the codewords of the first group *and* the prefix keyword (which is in the tenth position of Table V). For the exemplary embodiment described in the patent, the specification explains that

*a Huffman code* comprising an n-bit codeword segment, in this example 5-bits, is *assigned* as the initial or *prefix portion* of all members of the group under segment curve portion  $p_1$ , which n-bit *codeword* corresponds to the tenth position of Table V.

10:8-12 (emphasis added). *See also* Ex. 8, ‘056 File History at Aug. 4, 1988 Amd., at 7) (“a Huffman *codeword* comprising an n bit codeword segment, in this example 5 bits, is assigned as the prefix portion”) (emphasis added). Thus, Defendants’ construction, which requires that the prefix keyword code is “*not* a codeword”, is contradicted by the intrinsic evidence and impermissibly excludes the described embodiment. *Helmsderfer*, 527 F.3d at 1383.

Second, Defendants’ construction requires that the prefix keyword code “indicates that what follows.” This limitation lacks support in the intrinsic record. The prefix is described only as a special n-bit codeword having a length that is based on the combined probability of occurrence of the second group of codewords. While the specification discloses that the presence of the prefix keyword code signals a change in the coding scheme, the specification does not require that the prefix keyword code indicate that something follows.

Third, with respect to Defendants’ requirement that the information following the prefix keyword should be “treated as a suffix as opposed to a codeword,” neither the specification nor the claims require that suffixes and codewords be treated in particular manners, much less that they be treated in *different* manners. In fact, given that each suffix itself is a codeword (*see* Sec.

III.A.9 *infra*), it is unclear how the suffix could be treated differently than a codeword. Even if this were possible, Defendants’ construction still would not be clear because, in both the specification and the claims, not all **codewords** are treated in the same manner. For instance, some codewords are treated in accordance with a statistical rule, while other codewords are treated with a different coding rule. Given these disparate treatments of codewords themselves, Defendants’ construction does nothing to define the scope of the claim in a meaningful manner.

**9. “suffix”—(JCCS Term 14 (Claim 13))**

No construction of “suffix” is necessary. It is a common English word that is used in the claims in a manner that is consistent with its common usage. For instance, claim 13 defines codewords of the second set as having “the same prefix keyword code ... and a suffix.” The limitations required on the scope of “suffix” are set forth in claim 13, which specifies that the suffix have “such length that the prefix and suffix together have length outside said statistical rule.” Claim 13 is consistent with the specification’s description of the manner in which the second set of codewords are assigned to conditions: “The way this is done is to assign an additional code to be used as *a suffix after the n-bit keyword*.” 10:32-36, 10:49-51 (“That 8-bit code is *added as a suffix to* the n-bit keyword”) (emphasis added).

Both the claims and the specification reveal that “suffix” is used in accordance with its ordinary meaning; it comes after another portion of the word. However, should the Court determine that a construction of “suffix” would be helpful or otherwise is appropriate, PDIC’s proposal—“a plurality of bits that follows the prefix”—should be adopted.

Defendants’ construction, which requires that the “suffix” “is treated differently than a codeword,” is unsupported and confusing. The specification treats the suffix as a codeword which, like other codewords, is assigned to a signal condition. *Id.* at 10:36-39. The prosecution history also treats the suffix as a codeword. *See* Ex. 8 at 8 (suffix is a “binary codeword”).

Moreover, the specification and the claims do not indicate that codewords are treated in a particular manner or that a suffix codeword is treated differently than other codewords. To further illustrate the confusion engendered by Defendants' proposal, the specification and the claims do not even treat all *codewords* in the same manner. *See* Sec. III.A.8 *supra*.

**10. “grouping”—(JCCS Term 16 (Claims 14, 18, 20, 21, 13))**

**“grouping a plurality of different codewords of different codelengths into first and second groups”—(JCCS Term 24 (Claim 18))**

**“grouping the first group into a plurality of codewords representing more likely to occur run lengths of zero values and non-zero values”/ “grouping the second group into a plurality of codewords representing less likely to occur zero run length values”—(JCCS Terms 29, 30 (Claim 20))**

**“grouping the most likely to occur zero run length values and non-zero values into said first plurality of codewords” / “grouping the less likely to occur zero run length values”—(JCCS Terms 35, 36 (Claim 23))**

A core dispute between the parties is the meaning of “grouping.” PDIC’s construction is consistent with both the specification and the invention of the ‘056 Patent.

The ‘056 Patent accomplishes its inventive purpose using a modified statistical coding scheme, where codewords are designated as members of groups that are treated differently in the coding process. Treating the codewords as members of a group allows a different coding rule (*e.g.*, a statistical rule and a modified statistical rule) to be applied to each group. Consequently, the length of the codewords used in the overall coding scheme can be reduced relative to a scheme where an unmodified statistical coding rule is used for all codewords.

In the described embodiments, codewords are designated as members of a group through the presence or absence of bits associated with a key codeword: “The first group of codewords, for example, may include a key codeword that signals a change in the coding procedure from statistical coding using the first group of codewords to the use of a different coding scheme using a codewords drawn from the second group of codewords.” 3:7-12. Because a different coding

rule is used, “members of the second group of codewords on an average have a bit length which is significantly shorter than would otherwise occur for codewords assigned codeword lengths according to simple statistical coding.” 3:20-24. Thus, the presence or absence of key bits associated with the keywords to designate the codewords as members of a particular group is a feature that contributes to the inventive purpose of the ‘056 Patent. The key bits enables the use of multiple coding rules, resulting in codewords of shorter lengths.

The primary flaw in Defendants’ construction is that it wholly ignores the invention of the ‘056 Patent. The goal of the inventive encoding scheme is to reduce the length of codewords so that information, such as digital images, can be (for instance) stored or transmitted more efficiently. Unlike “designating codewords as members of groups,” Defendants’ “organizing” codewords “together in memory” does not reduce the length of codewords. Neither a particular physical organization in memory of codewords nor a particular physical organization of the codewords in memory relative to one another (*e.g.*, “together”) has any bearing on the invention.

Further, narrowing the claim scope to “organizing ***together in memory***” adds structural limitations that are not called for by the claim language or supported by the specification. In the context of the ‘056 Patent, “grouping” does not require physical grouping of group members in a particular manner or location, but instead is a logical concept, where codewords are designated as members of groups to indicate that the codeword should be treated in accordance with the coding rule associated with its group. Where the claims call for structural limitations, those limitations are recited. *See* Claim 14 (“means for grouping”). Furthermore, to the extent that the ‘056 Patent may describe an embodiment in which codewords are stored and physically located in a memory device in a particular order, the ‘056 Patent describes that embodiment as “one example of ROM 200.” 11:20. Limitations from described embodiments should not be imported

into claim language that, by its plain terms, is entitled to a broader scope. *See Kara Tech. Inc. v. Stamps.com Inc.*, 582 F.3d 1341, 1348 (Fed. Cir. 2009) (“we will not limit him to his preferred embodiment or import a limitation from the specification into the claims.”).

Defendants’ construction is also contradicted by the claim language itself. Here, the doctrine of claim differentiation compels the conclusion that “grouping” and “organizing” in the context of the ‘056 Patent have different meanings. *Phillips*, 415 F.3d at 1315 (“[T]he presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not in the independent claim.”). For example, independent claim 7 requires a “memory means for **grouping**” codewords. Its dependent claim 8 includes the further limitation that the “memory means including means for **organizing** the first and second groups.” *Id.* at 1314 (“claim terms are normally used consistently throughout the patent”). Similarly, dependent claim 19 (which is based on claim 18) states that “**said grouping includes organizing** the first and second groups.” The claims themselves thus indicate that “organizing” has a narrower scope than “grouping” within the context of the ‘056 Patent and, thus, that “grouping” in claims 14, 18, 20, 21 and 23 cannot be restricted to “organizing.”

Claim 18 provides further guidance. By including “organizing ... groups in memory,” Defendants attempt to limit the method of claim 18 to a structure that is not called for by the claim language. Notably, claim 18 also requires the step of “causing a memory means....” The omission of a structural limitation (*i.e.*, memory) in the step of “grouping” in claim 18 thus evidences a purposeful intent by the patent drafter not to limit “grouping” with that structure. If the drafter had intended to restrict “grouping” to occurring “in memory,” the drafter would have done so. Defendants’ construction thus is incorrect.

Defendants’ construction also is flawed in that it attempts to restrict claim 18 to “two

mutually exclusive groups,” a limitation that is confusing and not called for by the claim language. To the extent that the claim does require limitations on the characteristics of groups, those limitations are set forth in the claim language. *See, e.g.*, Claim 18 (“a first group of said codewords being organized statistically”; “a second group of different codewords having a codeword portion length...”). Any further limitations should not be added through a claim construction, particularly where those limitations introduce confusing new concepts and terminology that are not disclosed in the specification and, thus, would not be helpful to a jury.

With respect to Terms 29 and 30 which appear in Claim 20, when PDIC’s construction of “grouping” is incorporated into these phrases, the meanings of the phrases are clear in the context of claim 20 as a whole:

“designating as members of a first group a plurality of codewords that represent zero run length values and non-zero values that are more likely to occur”; and

“designating as members of a second group a plurality of codewords that represent zero run length values that are less likely to occur than the zero run length values in the first group”

PDIC’s constructions are consistent with the described embodiments. *See, e.g.*, Fig. 4, Table V.

Likewise, with respect to Terms 35 and 36 which appear in Claim 23, when PDIC’s construction of “grouping” is incorporated into these phrases, their meanings are clear:

“designating as members of the first group those codewords that represent zero run length values and non-zero values that are the most likely to occur”; and

“designating as members of the second group codewords representing zero run length values that are less likely to occur than the zero run length values represented by the codewords of the first group”

These constructions are consistent with the described embodiments. *See, e.g., id.*

The ‘056 Patent is directed to an inventive coding scheme that reduces codeword lengths by applying a particular coding rule to a codeword based on whether the codeword is a member of a particular group. PDIC’s construction embodies this invention and should be adopted.

11. **“first means for grouping, for a first given number of members, a first plurality of codewords representing a first plurality of signal conditions, each codeword representing a different condition, according to a first range of frequencies of occurrence of the condition of said signal, said first plurality comprising codewords of differing lengths, the shortest codeword occurring most frequently, the largest codeword occurring least frequently”—(JCCS Term 17 (Claim 14))**

The parties agree that this term is governed by § 112, ¶ 6, but disagree regarding the identification of the function, the meaning of the function, and the corresponding structure.

Here, the function is “grouping, for a first given number of members, a first plurality of codewords representing a first plurality of signal conditions.” The remainder of the language of the phrase describes the pre-existing structure of the codewords, not the function of grouping a first plurality of codewords. The function of “grouping” the codewords does not create the structural characteristics of the codewords, it simply “groups” codewords that already have that structure. *Lockheed Martin*, 324 F.3d at 1319; *King Pharmaceuticals*, 718 F. Supp. 2d at 712-13.

In the context of the claims and the specification, the function of “grouping, for a first given number of members, a first plurality of codewords representing a first plurality of signal conditions” means “designating a first given number of codewords as members of a first group of codewords that represents a first plurality of conditions of a signal.” The construction of “grouping” is discussed in Sec. III.A.10 *supra*. See also Ex. 7 at ¶¶ 30, 35.

With respect to the structure that corresponds to the function, the only structure that the ‘056 Patent clearly links to performing the function of “grouping codewords” is found in memory 200. See Ex. 2 at 994 (memory); Ex. 3 at 25/14-25/16; Ex. 7 at ¶ 35. The ‘056 Patent discloses two groups of codeword members, where each group is treated in a different manner in the encoding scheme. 3:7-12. The ‘056 Patent further discloses that ROM 200 stores the codeword members of the first and second groups. 6:3-5. The ‘056 Patent also discloses that the presence (or absence) of a special (or key) indicator, such as a bit or bits associated with a

codeword, identifies the coding rule for that codeword. 3:8-10; 9:67-68. In other words, the presence or absence of a key bit(s) associated with a codeword designates the codeword as a member of a group that should be treated in accordance with a particular coding rule. While other structures are required to control the addressing and operation of the memory to access the codewords, the key bit(s) in memory 200 is (are) the only structure that actually performs the function of “grouping” as that term is understood within the context of the claim and the specification. *See Asyst Techs.*, 268 F.3d at 1371.

Defendants’ identification of corresponding structure is flawed because it includes structure (*i.e.*, “sections 501 and 502 of memory 200 and logic structure for addressing the memory”) that is not necessary to perform the claimed function of “grouping.” First, separate sections 501 and 502 in the memory 200 are only “one example of ROM” and thus are not required for grouping. 11:20. For instance, sections 501 and 502 are not shown in the example of ROM 200 in the embodiment of Figure 2. Sections 501 and 502 are merely examples of how codewords may be stored, but they are not required for “grouping” codewords.

Second, the specification discloses that “the logic structure for addressing the memory” (*i.e.*, Defendants’ identified structure) is related to memory addressing, not codeword grouping. Consistent with the specification, the claims demonstrate that the logic structure for addressing the memory is not associated with the grouping function. For example, dependent claim 16 includes the sole further requirement of an “address means for accessing said first and second means [for grouping] with an address code.” Under the doctrine of claim differentiation, the logic structure for addressing the memory thus is **additional** structure. *See SanDisk Corp. v. Kingston Tech. Co.*, 695 F.3d 1348, 1361 (Fed. Cir. 2012) (“Where...the sole difference between the independent claim and the dependent claims is the limitation that one party is trying to read

into the independent claim, the doctrine of claim differentiation is at its strongest.”). This additional structure performs an “accessing” function, not “grouping.”

12. **“second means for grouping, for a second given number of members, a second plurality of codewords representing a second plurality of signal conditions, each second plurality of codeword representing a different condition according to a second range of frequencies of occurrence of the conditions of said signal, the second range of frequency of occurrence having a combined frequency of occurrence lying in the first range, all said codewords of said first and second pluralities being different each codeword of the second plurality having a common codeword portion length which is statistically based on said combined frequency of occurrence relative to said first range—(JCCS Term 18 (Claim 14))**

The parties agree that this term is governed by § 112, ¶ 6, but disagree regarding the identification of the function, the meaning of the function, and the corresponding structure.<sup>7</sup>

Based on the clear language of the claim, the function is “grouping, for a second given number of members, a second plurality of codewords representing a second plurality of signal conditions.” As discussed in Section III.A.11 *supra*, the remainder of the language of the phrase describes the pre-existing structure of the codewords, not the function of grouping codewords.

In the context of the claims and the specification, the “grouping” function means “designating a second given number of codewords as members of a second group of codewords that represents a second plurality of conditions of a signal.” *See* Sec. III.A.11 (Term 17) *supra*.

With respect to the corresponding structure, the only structure that the ‘056 Patent clearly links to performing the function of “grouping codewords” is found in memory 200. *See* Ex. 2 at 994 (memory); Ex. 3 at 25/14-25/16; Ex. 7 at ¶ 41. As discussed in Section III.A.11, the presence or absence of a key bit(s) associated with a codeword designates the codeword as a member of a group. While other structures control the addressing and operation of the memory to access the codewords, the key bit(s) in memory 200 is (are) the only structure that performs the function of

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<sup>7</sup> PDIC’s arguments and constructions of the other phrases within Term 18 are set forth in Sec. III.A.13 (Term 20) and Sec. III.A.14 (Term 22).

“grouping,” as that term is understood within the context of the claim and the specification.

Defendants’ identification of corresponding structure is flawed because it includes structure (*i.e.*, “section 502 of memory 200, which includes Table IV, and logic structure for addressing ROM 200 in Fig. 2”) that is not necessary to perform the claimed function of “grouping.” First, section 502 in the memory 200 is not required for grouping as it is only “one example of ROM 200.” 11:20; *see* Sec. III.A.11 (Term 17) *supra*. Second, the specification discloses that “the logic structure for addressing the memory” is related to memory addressing, not codeword grouping. *See* Sec. III.A.11 (Term 17) *supra*.

**13. “combined frequency of occurrence”—(JCCS Term 20 (Claims 14, 21))**

**“combined probability of occurrence value”/ “combined probability value—(JCCS Term 27 (Claim 18))**

The terms “frequency of occurrence” and “probability of occurrence” are used interchangeably. *See* D.I. 305 at 1; Ex. 1 at 27; 5:36-39. PDIC’s constructions clarify that these terms refer to the combined probability of occurrence “of the codewords in the second group.”

Defendants’ construction improperly limits this term to being a “sum” of all of the probabilities of occurrence of the codewords in the second group. Neither the specification, the prosecution history nor the claims restrict the manner in which the combined probability of occurrence must be determined, much less that individual probabilities must be determined and summed. In Figure 4, the combined probability of occurrence is a “group probability” that corresponds to an area “ $P_p$ ” under a probability curve, which, in this example, is “about 15%” of the total area under the probability curve. ‘056 Patent at Fig. 4; 9:27-35; 9:66-67. The specification does not limit the area  $P_p$  or 15% as being determined by taking a “sum,” and there is no support for narrowing the scope of the claims by including such a limitation. Defendants’ narrowing construction thus is not supported, as it includes limitations that do not even appear in

the specification and are not called for by the claims.

**14. “common codeword portion length” / “codeword portion length” / “codeword portion of a length”—(JCCS Term 22 (Claims 14, 18, 21))**

PDIC’s construction is consistent with the specification and the claims. The “codeword portion length” terms each refer to “the length of a portion of a codeword.” When the word “common” is added, the term further is limited to the length of a portion of a codeword “that is the same portion included in another codeword.”

Defendants’ construction suffers from multiple flaws. First, the construction ignores that each of these terms refers to a “length,” which is an ordinary term that refers to how long something is. A primary focus of the ‘056 Patent is the length of codewords. By omitting “length,” Defendants’ construction thus deviates from the invention and does not make sense in the context of the claims. *See* claim 14 (“each codeword...having a common codeword portion length which is statistically based on said combined frequency of occurrence”); claim 21 (“the codewords ... having the same codeword portion of a length according to said statistical rule and a total length differing from said statistical rule”). Namely, “a first plurality of bits” are not determined based on a statistical rule. Rather, the “length” of the bits are based on the rule.

Second, by construing a “codeword portion” as “not a codeword”, Defendants’ construction limits the claim scope in a manner that is directly contrary to the specification and excludes the described embodiment. *See* Sec. III.A.8 (Term 12) *supra*.

Third, Defendants’ construction requires that the “first plurality of bits indicates that what follows be treated as a suffix as opposed to a codeword.” However, neither the specification nor the claim language requires that a codeword portion length or a common codeword portion length must indicate that something *follows*, much less that a suffix follows. *See* Sec. III.A.8 *supra*. The claim language does not place any locational requirement on the codeword portion

and does not require that the codeword portion has to precede anything. Defendants thus import limitations from the described embodiment (where the common codeword portion is a prefix) when the claim language plainly merits a broader scope. *See Kara Tech.*, 582 F.3d at 1348.

Finally, Defendants' construction introduces confusion and ambiguity because the intrinsic record is clear that a suffix can be a codeword. *See* Secs. III.A.8 and III.A.9 *supra*. This ambiguity is exacerbated by the fact that, in the '056 Patent, a first set of codewords is treated differently than a second set of codewords, which will leave the jury to wonder whether the suffix should be treated differently than the first codewords or the second codewords.

**15. “a first group of said codewords being organized statistically in a first given order in which at least generally the shortest codeword length manifests that signal condition having the greatest probability of occurrence and at least generally the greatest codeword length manifests that signal condition having the lowest probability of occurrence”—(JCCS Term 25 (Claim 18))**

**“a second group of different codewords having a codeword portion length such that the combined probability of occurrence value of all of the signal conditions represented by the second group is organized statistically with said first given order codeword length based on said combined probability value regardless the relative codeword lengths of said second group codewords as compared to the codeword length of the next adjacent codewords of the first group”—(JCCS Term 26 (Claim 18))**

These phrases do not require construction apart from any terms and sub-phrases that have been separately construed.<sup>8</sup> Nonetheless, Defendants are asking the Court to find that a person of skill in the art cannot understand an entire claim that the Patent Office has examined and allowed twice.<sup>9</sup> As a backup, Defendants are asking the Court to entirely rewrite the claim in a contorted and narrowing manner that has no purpose other than to advance a non-infringement or invalidity defense. Claim construction is not an “obligatory exercise in redundancy.” *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997). And, though the task may be difficult,

<sup>8</sup> PDIC's arguments and constructions for phrases contained within Terms 25 and 26 are set forth in Sec. III.A.3 (Terms 5, 6), and Sec. III.A.13 (Term 27)

<sup>9</sup> *See* Ex. 9, May 4, 2012 Notice of Intent to Issue Ex Parte Reexamination Certificate, at 2.

claims should be construed in a manner that supports their validity. *Exxon Research*, 265 F.3d at 1375 (cautioning against holding a claim indefinite “merely because it poses a difficult issue of claim construction”). By embracing this standard, courts “accord respect to the statutory presumption of validity, and [] protect the inventive contribution of patentees, even when the drafting of their patents has been less than ideal.” *Id.* Defendants ignore these principles in the proposal that they offer to the Court.

Claim 18 does not need to be rewritten to be understood. Features of the invention that are clearly described in the '056 Patent are embodied in these clauses, which reflect the coding rules applied to the two groups of codewords. Namely, a statistical rule is applied to the first group, resulting in a logical organization where the lengths of codewords are inversely related to their probabilities of occurrence. A different coding rule is applied to the second group, where the length of a common codeword portion is logically organized with the lengths of the codewords of the first group. This organization is based on the second group's combined probability of occurrence. An example of this logical organization is shown in Table V, in which the second group of codewords (indicated by “keyword”) is positioned within the first group of codewords in the tenth position in the Table. The overall lengths of second codewords are 13 bits (*i.e.*,  $01011x_1 \dots x_n$ ) even though the lengths of the next adjacent codewords are 5 bits and 6 bits. In other words, the second group of codewords is statistically organized with the first group of codewords regardless of the relative lengths of the second codewords (*e.g.*, 13 bits) as compared to the adjacent codeword lengths of the first codewords (*e.g.*, 5 and 6 bits). Where, as here, the claim language is consistent with the specification and amenable to construction, the Court should decline to find the claim indefinite. *Biosig Instr.*, 715 F.3d at 898.

The Court also should decline to adopt Defendants' alternative constructions. Here, a

critical flaw in the constructions is the requirement that codewords be “organized *in memory in order*.” These structural limitations are not called for by the language of the method set forth in claim 18 or the intrinsic record, for the reasons discussed above in Sec. III.A.10 (the “grouping” terms). Moreover, in the context of the ‘056 Patent, “grouping” does not require physical grouping (or organization) of group members in a particular manner (*e.g.*, “order”) or location, but instead is a logical concept, where codewords are statistically ordered in a logical manner based on their probabilities of occurrence. This logical ordering is called for by the statistical coding rule, which defines the length of the codewords based on their probabilities of occurrence regardless of where the codewords are physically located in memory and regardless of whether the codewords are physically located in a particular order.

Defendants’ construction is further flawed in that it excludes the one example in the specification that arguably may have some type of physical ordering in the ROM 200. In Figure 5, ROM 200 is divided into sections 501 and 502, with non-zero values stored in section 501 and zero run length values stored in section 502. However, this physical division of codewords does not align with Defendants’ construction. In Table V, when the codewords are logically placed in statistical order, non-zero values are *interspersed with* zero run length values. Thus, to the extent codewords may be physically ordered in sections 501 and 502, that physical ordering differs from their statistical ordering. Thus, Defendants not only improperly add limitations that are not called for by the claim language, but they do so in a manner that excludes the only embodiment in the specification that Defendants contend supports their narrow construction.

Defendants’ construction for the “second group” of codewords suffers from the same critical flaw. Here, Defendants’ construction requires that the entire second group of codewords be stored “inside the first group of codewords at a location” in memory. Again, for the reasons

discussed, the codewords of the first group are not physically located in sections 501 and 502 in their statistical order, and thus the codewords of the second group (which are located in section 502) are not located “inside” the first group as required by Defendants’ construction. A construction which excludes the described embodiments should be rejected by the Court.

**16. “causing a memory means in response to the conditions of said digitized signal applied as an input thereto to output that codeword corresponding to the input digitized signal condition”—(JCCS Term 28 (Claim 18))<sup>10</sup>**

PDIC’s proposed construction mirrors the claim language and is offered to clarify that “a memory means” is “a memory device, which has data storage elements and associated circuitry to access the stored data.” *See* Ex. 2 at 994 (memory, memory cell), 1560 (storage element); Ex. 3 at 25/14-25/16; *see also* Ex. 7 at ¶¶ 24, 28. In response to conditions of the digitized signal that are applied as an input to the memory device, the memory device outputs that codeword which represents the condition of the input digitized signal.

Defendants’ construction requires the memory to “receive[] the digitized signal as an input.” However, the claim language is clear that the *conditions* of the digitized signal are applied as an input to the memory. For that reason alone, Defendants’ construction is wrong.

The claim language is consistent with the described embodiments. Signals that represent the conditions of the digitized signal, such as non-zero values and zero run length values, are applied as inputs to the ROM 200, which outputs the corresponding codewords. 11:18-33, 12:61-64. Defendants’ construction excludes this described embodiment.

**17. “wherein the shorter codewords generally occur more frequently and the longer codewords generally occur less frequently”—(JCCS Term 32 (Claim 21))**

The meaning of this phrase<sup>11</sup> is readily understood from the claims and the specification.

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<sup>10</sup> PDIC’s construction for this term is: “causing a memory device, which has data storage elements and associated circuitry to access the stored data, in response to the conditions of the digitized signal applied as an input to the memory device to output that codeword representing the condition of the input digitized signal.” *See* Ex. 14, E-mail from D. Sangalli to B. Erickson dated Aug. 14, 2013.

Exemplary codewords are illustrated in statistical order in Table V, showing that codewords that generally occur more frequently are shorter than longer codewords that generally occur less frequently. In the example of Table V, multiple codewords have the same shorter length of “4” although their individual probabilities of occurrence are not the same. Similarly, multiple codewords have the same longer length of “10” although their individual probabilities of occurrence are not the same. Multiple codewords having the same length but slightly different frequencies of occurrence illustrates the “generally occur more/less frequently” concept.

## **B. The ‘103 Patent**

### **1. “a video input for receiving analogue video signals directly from a camera”—(JCCS Term 1 (Claims 1, 11))**

The only words requiring construction in this phrase are “directly” and “camera” as the meaning of the remaining words are clear in the context of the claims. The word “camera” has a well-understood meaning and the specification provides no express definition that would alter such meaning. *See* 1:13-15, 3:33-36. The claim’s reference to “camera” would have led a person skilled in the art in 1985 to understand “camera” to carry the standard industry meaning of a light-tight enclosure containing an aperture through which the light from an object passes and forms an image on a light sensitive material. Ex. 1 at 2; Ex. 2 at 241 (camera). The claim requires that the “camera” provide analog video signals to the video input and thus the skilled person would understand that the claimed camera would require circuitry to generate analog video signals representative of the formed image.

The term “directly” was added during prosecution “to more clearly distinguish over systems having a video input at the receiver end of a transmission system which receives broadcast television signals instead of receiving video signals ‘directly’ from a camera.” Ex. 10,

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<sup>11</sup> Defendants contend that this phrase is indefinite but have not yet provided the basis for their contention. PDIC will provide a specific rebuttal if Defendants do provide such a basis.

‘103 File History at Oct. 24, 1988 Amd., at 3. Thus, “directly” was added to specify that the analogue video signals are received at the video input over a ***non-broadcast*** transmission link from the camera. The applicant explained the amendment by way of examples:

the language receiving video signals ‘directly’ from a camera output indicates that the video coder ***may receive*** the camera output from a fixed transmission link ***or, for example***, from a switch to select between camera outputs, a mixing desk for compensating for fading between cameras, ***etc.***

*Id.* (emphasis added) The applicant also noted that the prior art

fails to teach a digital video coder in which a video input receives analog video signals directly from a camera either via a fixed transmission link or after being filtered or otherwise processed at the camera output but rather teaches receiving a broadcast television video signal at the receiver end of a transmission system.

*Id.* at 7. PDIC’s construction is consistent with this amendment as it requires that the analogue video signals are received over a wired transmission link and not a broadcast transmission link.

Defendants’ construction introduces redundancies and confusing limitations. For example, requiring an “***analog*** video input ***in the video coder***” is redundant. The plain language already requires that the claimed “digital video coder” comprise a video input and that the video input receive analogue video signals. Second, by requiring that the camera be a “standalone” device, Defendants narrow the scope of the claim to a device that is neither disclosed nor warranted by the intrinsic record. The word “standalone” does not appear anywhere, which will leave the jury confused as to its import. And, the statements in the prosecution history did not disclaim claim scope such that the phrase “for receiving...directly from a camera” should be limited to a “standalone” device. Any disavowal of claim scope must be clear and unmistakable. *Omega Eng., Inc. v. Raytek Corp.*, 334 F.3d 1314, 1325-26 (Fed. Cir. 2003). Providing examples of how the claimed device ***may*** receive video signals does not mean that the device can ***only*** receive signals in those manners.

2. **“control means responsive to the digital words at the output of the converter to generate digitally, as a function of the average amplitude level represented by previous said digital words at the converter output, a control signal for application to the control input of the converter”—(JCCS Term 4 (Claim 1))**

**“control means responsive to the digital words at the output of the converter to generate digitally, as an arithmetic function of the amplitudes represented by the digital words at the converter output, a control signal for application to the control input of the converter for controlling the average level represented by said digital words by maintaining the average level of said digital words within a predetermined range”—( JCCS Term 10 (Claim 11))**

Contrary to Defendants’ contention, these terms are not means-plus-function terms governed by 35 U.S.C. § 112, ¶ 6. “Means-plus-function claiming applies only to purely functional limitations that do not provide the structure that performs the recited function.” *Welker Bearing Co. v. PHD, Inc.*, 550 F.3d 1090, 1095 (Fed. Cir. 2008). While the use of the word “means” invokes a rebuttable presumption that § 112, ¶ 6 applies, this presumption is rebutted where a claim itself recites sufficient structure or material for performing that function. *Envirco Corp. v. Clestra Cleanroom, Inc.*, 209 F.3d 1360, 1364 (Fed. Cir. 2000). To determine whether the claim recites such “sufficient structure or material,” the Court should consider all of the claim language, and whether it has an understood meaning when read in the context of the intrinsic evidence. *See, e.g., Linear Tech. Corp. v. Impala Linear Corp.*, 379 F.3d 1311, 1320 (Fed. Cir. 2004); *TI Grp. Automotive Sys. (N. Am.), Inc. v. VDO N. Am., L.L.C.*, 375 F.3d 1126, 1135 (Fed. Cir. 2004). The claim recites “sufficiently definite structure” to preclude application of § 112, ¶ 6 even if the claim term is “defined in terms of its function” and/or does not “connote a precise physical structure in the minds of those skilled in the art.” *Personalized Media Commc’ns., L.L.C. v. ITC*, 161 F.3d 696, 705 (Fed. Cir. 1998).

Examination of these terms, in view of the claim language, specification and the understanding of a person skilled in the art, demonstrates that these are **not** purely functional limitations. Ex. 12, Declaration of Vernon Thomas Rhyne III, at ¶¶ 14-16. Rather, these terms

recite a definite structure of a specialized controller that: (1) is operatively connected to a control input of an analog-to-digital converter to generate a digital output to control that converter, (2) is structured to receive “digital words” as an input, (3) includes a processor required to execute the recited algorithm, and (4) executes that algorithm to perform the recited function. *Id.* at ¶¶ 15-19. The claims require that this specialized controller, and not just any generic “means,” be used to perform the recited function. Thus, the presumption that § 112, ¶ 6 applies has been rebutted.

**a. The Patentee Did Not Use Classic Means Plus Function Format**

Notably, these terms do not use the classic means-plus-function construct involving a recitation of “means” followed by the signaling preposition “for” and then an “-ing” verb form to explain what the function of the generic ‘means’ is. *See Lighting World, Inc. v. Birchwood Ltg., Inc.*, 382 F.3d 1354, 1358 (Fed. Cir. 2004); *High Point Sarl v. Sprint Nextel Corp.*, 2012 U.S. Dist. LEXIS 108485, \*22 (D. Kan. Aug. 3, 2012) (internal citations omitted). Indeed, the other claims show that the drafter knew how to use this classic construct when he wanted to invoke § 112, ¶ 6, and when he did not, he purposefully chose other language. For instance, in claim 3 (dependent from claim 1), the drafter constructed the limitation as: “*means for sampling* the selected words and *for accumulating* a predetermined number of the selected words.” However, for the “control means” in claims 1 and 11, the drafter used “means” in a different fashion—*i.e.*, “means...*to generate*.” This distinction in claim drafting of the same set of claims is an indication that the patentee did not intend to invoke § 112, ¶ 6. Ex. 12 at ¶ 14.

**b. Claims 1 and 11 Recite a Particular, Definite Structure for “Control Means”**

One skilled in the art would understand by reviewing the claim language and intrinsic evidence that the “control means” is a specialized controller rather than an abstract “means” for doing something. Ex. 12 at ¶ 15. The word “control” connotes the structure of a controller that both parties agree represents a component of the structure of the “control means.” *Id.* In view of

additional qualifying language in the claim, one skilled in the art would understand the “control means” is not just any controller, but it has a specific structure where it generates *digitally* a *control* signal to apply to a *control input of the converter*. *Id.*; *Cf. Personalized Media*, 161 F.3d at 705 (noting “digital” qualification “narrowed the scope of the structures covered by the claim and makes the term more definite.”). Such limitations provide an indication of what the control means “is” structurally – *i.e.*, a particular controller that is operatively connected to a control input of the converter” and that generates a digital output that controls the converter in the manner specified in the claims – and thus impart a particular structure to the control means. *Ex. 12* at ¶15; *see also TI Grp. Automotive Sys.*, 375 F.3d at 1135 (concluding that § 112, ¶ 6 did not apply to “pumping means” where “[t]he written description informs and fully supports the structure recited in the claims.”); *Rodime PLC v. Seagate Tech., Inc.*, 174 F.3d 1294, 1303-04 (Fed. Cir. 1999) (finding claim reciting location and interconnection of structural sub-elements to perform recited function was sufficient to overcome presumption of § 112, ¶ 6).

The “responsive to...” limitation also provides structure as it requires the input of the controller to be operatively connected to the output of the “converter.” This language narrows the scope of the controller to one that receives such input and that has a particular algorithm that it executes based on such input. *Ex. 12* at ¶ 16. Similar to *Linear*, these limitations describe the objective and desired output of the specialized controller and would enable a person skilled in the art to draw structural arrangements of the “control means.” *Cf. Linear*, 379 F.3d at 1320.

Furthermore, in the “control means” limitations here, the claim specifically describes the steps of the algorithm executed to generate digitally the control signal. *Id.*; *Ex. 12* at ¶¶ 17-19. One skilled in the art would understand a particular, definite structure of the specialized controller that performs the recited function given the claim’s recitation of a complete algorithm

for deriving such a control signal. Ex. 12 at ¶¶ 17-19.

The grammatical structure of claims 1 and 11 also is instructive, as it signals a transition from the recited function to the respective additional structural limitation using a comma and the language “as a function of.” Then, the claims fully set forth the algorithm for performing the recited function which is executed by the specialized controller. *Id.* Indeed, the claim itself recites the input to the algorithm (digital words), the output of the algorithm (control signal), and the algorithm applied to the input to derive the output (averaging function and/or arithmetic function) and implies that the algorithm is executed on a processor of the specialized controller. *Id.*; see, e.g., *Gemalto S.A. v. HTC Corp.*, 2012 U.S. Dist. LEXIS 89764, at \*64-72 (E.D. Tex. June 28, 2012) (limitation was not subject to § 112, ¶ 6 as the claim recited the algorithm to be executed in an implied processor to perform the function.)

The claim provides all the structure that is required to generate the control signal. The control means must receive digital words from the output of an analogue-to-digital converter. The control means digitally generates a control signal. Digital generation requires a processor. The control signal is digitally generated as a function of the average amplitude level represented by the digital words (claim 1) or as an arithmetic function of the digital words (claim 11). One skilled in the art would know how to use an averaging function and/or arithmetic function to generate the control signal given that the computational operations were well-known and that the claim recites a complete algorithm and the structure to execute such algorithm. Ex. 12 at ¶ 19. There is no requirement that the claims recite a specific algorithm or precise physical structure, or that the patent disclose source code; rather, the claims must only recite “sufficient structure” for one skilled in the art to perform the recited function. *Typhoon Touch Technologies, Inc. v. Dell, Inc.*, 659 F.3d 1376, 1385-86 (Fed. Cir. 2011); *Personalized Media*, 161 F.3d at 705. That

requirement is met here. “Control means” does not fall within the confines of § 112, ¶ 6.

**c. PDIC’s Alternative Construction Identifies the Correct Structure and Function**

Should the Court find that § 112, ¶ 6 does apply to the “control means” terms, PDIC’s alternative construction identifies the correct structure and function.

Here, the parties agree that the function of the “control means” limitations is “generate digitally, as a function of the average amplitude level represented by previous said digital words at the converter output, a control signal for application to the control input of the converter.” Defendants incorrectly contend that extra language should also be included. The “responsive to...” language is not part of the function. Instead, it simply describes a structural relationship between the input to the “control means” and the output of the converter and is part of the algorithm executed by the “control means” itself. Ex. 12 at ¶ 23; *High Point Sarl*, 2012 U.S. Dist. LEXIS 108485, at \*22 (finding “responsive to” language in claim described the relationship between the first means and other claim elements and was not part of the recited function”). The “for controlling the average level...” language has nothing to do with generating the control signal, but instead describes what is done with the control signal after it is generated. Ex. 12 at ¶ 23; *cf. United Video Properties, Inc. v. Amazon.com, Inc.*, 2012 U.S. Dist. LEXIS 86914, at \*27, 30 (D. Del. June 22, 2013) *citing Lockheed Martin*, 324 F.3d at 1319.

The parties also agree that (assuming § 112, ¶ 6 applies) the corresponding structure for the “control means” terms includes controller 10 having a processor 11. However, the parties dispute which disclosed algorithms, and which steps of such algorithms, perform the claimed function. The specification reveals that the corresponding structure includes the controller 10 having a processor 11 executing an algorithm that performs the function of generating digitally the control signal as a function of the average amplitude level derived from, for example, computing a mean of samples or accumulating a predetermined number of samples, or as an

arithmetic function of the amplitudes, or equivalents of such techniques. Abstract, 1:19-24; 2:19-22, 28-30, 64-66, Fig. 3 (steps 12, 13); *see also* Ex. 12 at ¶¶ 31-33. The specification discloses and claims various algorithms that can be executed on the processor 11 of controller 10, and various steps that can be performed while executing such algorithms, to compensate for variations in the input “analogue video signals.” Ex. 12 at ¶¶ 28-29. Specifically, controller 10 can execute various algorithms that receive digital words representing various amplitude levels as an input and generate digitally a control signal as a function of these amplitudes. *Id.* at ¶ 27; *see also* Ex. 13, ‘103 File History at claim 1 (“control means responsive to the digital words at the output of the converter to generate digitally, **as a function of the amplitudes** represented by the digital words at the converter output, a control signal”) (emphasis added). These various algorithms include many operations that are commonly understood. Ex. 12 at ¶¶ 29-30.

However, not all of the disclosed algorithms, and certainly not all of the programmatic steps of each of the disclosed algorithms, are necessary to perform the claimed function (to generate digitally a control signal “as a function of the **average amplitude level**” or “as an **arithmetic function of the amplitudes**”). *Id.* at ¶ 30. Rather, the corresponding structure that is **necessary** to perform the claimed function, as described in the specification, is the structure identified by PDIC. The intrinsic evidence demonstrates that a “mean” is a mathematical concept referring to several different types of mathematical averaging operations. *See, e.g.*, 2:28-30, 64-66, Fig. 3 (steps 12, 13); Ex. 10 at 3-4; Ex. 11, ‘103 File History Mar. 28, 1988 Amd., at 8; *see also* Ex. 12 at ¶ 33. One way of providing a mean (or average of a sample set) is to accumulate a predetermined number of values. Ex. 12 at ¶¶ 33-34.

The clear intrinsic link between this structure and the recited function is evident. For example, the ‘103 Patent states that “the function of the controller 10 is to adjust the converter

gain to compensate [*sic*] variations in video input amplitude” (2:1, 19-21), that “samples are accumulated and if the mean is not within the deemed grey-level range, an adjustment is made” (2:28-30), and that FIG. 3 includes the steps of “update accumulator 12” and “acc’r full 13”. *See also, e.g.*, Ex. 11 at 8 (“At the heart of the present invention is the microprocessor based controller 10 shown in Fig. 1 which serves to adjust the analogue to digital converter gain to compensate for variations in video input signal amplitude.”); Ex. 11 at 9 (the claim “defines the controller in terms of a control means”); Ex. 10 at 3-4 (“claims 1 and 12 have been amended to indicate that the control signal generated by the control means is generated as a function of the average amplitude level represented by sampled digital words, whereby claims 1 and 12 now require that some measure of the average signal level be determined, e.g., by taking the arithmetic mean of the samples, the geometric means, the root mean square, etc.”).

Defendants contend that the corresponding structure must include the *entirety* of the algorithm of Fig. 3, and thus incorporate structure beyond that which is *necessary* to perform the claimed function. *See TI Grp. Automotive Sys.*, 375 F.3d at 1135. For example, Defendants contend that the corresponding structure must include step 6 of Fig. 3 which discharges a sample that is the same as a previous one, step 5 which discharges a sample that “is at a black level (zero amplitude),” step 16 which counts “super black” and “super white” samples, and step 18 which adjusts a reference voltage based on determining that the counted “super black” and “super white” samples exceeds a respective predetermined number. The “control means” does not have to execute these steps to perform the recited function and, therefore, these steps are not necessary structure. Ex. 12 at ¶ 30. Indeed, the intrinsic record is clear that these additional steps are merely “optional features” to the algorithm that eventually performs the recited function. *See, e.g.*, 1:25-26; Ex. 13 at original claims 2-9; Ex. 12 at ¶ 30.

Claim differentiation also demonstrates that Defendants' extra structure is not necessary to perform the recited function. For example, steps 5, 6, 16 and 18 of Fig. 3 correspond to limitations in dependent claims 6, 5 and 7, respectively, which the specification explicitly refers to as "optional features." 1:25-26. The separate claiming of these optional steps of Fig. 3 cements that Defendants' proposed structure vastly overreaches beyond what is necessary or clearly linked to perform the claimed function. *Cf. Versa Corp v. Ag-Bag International Ltd.*, 392 F.3d 1325, 1329 (Fed. Cir. 2004); *St. Clair Intellectual Prop. Consultants, Inc. v. Matsushita Elec. Indus. Co., Ltd.*, 691 F. Supp. 2d 538, 561 (D. Del. 2009) (limiting corresponding structure to only algorithm steps depicted in flow chart that were necessary to perform recited function).

3. **"means for sampling selected words and for accumulating a sum of a predetermined number of the selected words and to apply to the said control signal a correction proportional to the difference between the accumulated sum and a reference value"—(JCCS Term 7 (Claim 3))**

The parties agree that § 112, ¶ 6 applies, but do not agree on either the function or the structure. While the parties agree that the function includes "sampling selected words and accumulating a sum of a predetermined number of the selected words," Defendants contend that it must further include the language "to apply to the said control signal..." This contention is irreconcilable with the claim language and grammatically nonsensical. The entire clause reads:

the **control means** includes **means for sampling** selected words and **for accumulating** a sum of a predetermined number of the selected words and **to apply** to the said control signal a correction proportional to the difference between the accumulated sum and a reference value

Claim 3 (emphasis added). Notably, as discussed in Section III.B.2(a) *infra*, the drafter purposefully selected the preposition "to" when referring to structural limitations and "for" when identifying means plus function terms. This intentional word choice signals that the "means *for*" limitation in claim 3 corresponds only to the *sampling* and *accumulating* functions. *See also* Ex. 12 at ¶¶ 37-38. The "to apply" language introduces further structural limitations of the algorithm

executed by the “control means”—*i.e.*, the controller also applies a correction to the control signal that is proportional to the difference between the accumulated sum and a reference value. This intentional grammatical structure within the same claim plainly illustrates that the patent drafter knew how to invoke § 112, ¶ 6 and did so only when he meant for § 112, ¶ 6 to apply.

The parties also disagree on the corresponding structure of the “means for” term of claim 3. PDIC’s proposal identifies the structure that the specification clearly links to the function of “sampling and accumulating.” Defendants’ proposal (*i.e.*, the *entirety* of the algorithm of Figure 3) is flawed because, as discussed above in Section III.B.2(c) it improperly seeks to import structure well beyond that which is *necessary* to perform the claimed function.

First, the particular algorithm of Fig. 3 and its accompanying text is not the only structure that is disclosed to perform the “sampling and accumulating” function as Defendants propose and should not be so limited. *See* Ex. 12 at ¶¶ 29-30, 39; *see also Versa Corp*, 392 F.3d at 1329. Second, claim differentiation for claim 3 and its dependent claims (*e.g.*, 5-7) results in a finding that, for example, steps 5, 6, 16 and 18 of Fig. 3 are additional claim limitations only found in dependent claims 6, 5 and 7 respectively. *Id.* Third, the additional claim limitations of claims 4-7 are limitations on the “control means” term of claim 1 and not limitations on the “means for sampling...and for accumulating” term of claim 3 and thus cannot be necessary structure.

#### 4. “analogue-to-digital converter”—(JCCS Term 2 (Claims 1, 11))

PDIC’s construction is consistent with the intrinsic record. The specification and prosecution history refer to an “analogue-to-digital converter” as a device that produces digital signals at its output in response to input analogue signals. This description also is consistent with the term’s ordinary meaning. *See, e.g.* 1:40-41; Ex. 11 at 8 (“The present invention includes an analogue to digital converter that produces digital signals at its output in response to an input analogue video signal.”); Ex. 1 at 3; Ex. 4, IEEE STANDARD DICTIONARY OF ELECTRICAL AND

ELECTRONICS TERMS, at 39-40 (analog-to-digital converter); Ex. 5, IBM DICTIONARY OF COMPUTING, at 15-16 (analog-to-digital converter). PDIC's construction aligns this description of an analogue-to-digital converter with the remaining claim language, resulting in "a variable sensitivity device that produces digital words at its output in response to input analog signals"

Defendants' construction again narrows the scope of the claim in an unwarranted manner. Namely, Defendants contend that "analogue-to-digital converter" has a plain and ordinary meaning but then propose an ordinary meaning that requires the converter to be "in the video coder." One skilled in the art would not understand that analogue-to-digital converters ordinarily *must* be in a video coder. Moreover, this limiting language is unwarranted, as it effectively transforms the preamble of the claims (*i.e.*, "A digital video coder") into a structural claim limitation. Where (as here) the body of the claim describes a structurally complete invention, a preamble is not limiting. *Deere*, 703 F.3d at 1358.

**5. "a control input for varying the sensitivity of the converter"—(JCCS Term 3 (Claims 1, 11))**

PDIC's definition construes the only word of the phrase that requires construction – "sensitivity" – and is consistent with the intrinsic and extrinsic records. An analogue-to-digital converter is a device that produces digital words at its output in response to input analog signals. The sensitivity of the converter is the relationship (in this producing process) between those input analog signals and the corresponding output digital words that the converter produces. Ex. 1 at 4; Ex. 4 at 818-819 (sensitivity); Ex. 6 at G-1 (gain), S-5 (sensitivity).

Defendants do not give this term its proper breadth. First, requiring that the "control input" be interpreted as "an input that received the control signal generated by the control means" is unnecessary, introduces confusion, and excludes a preferred embodiment to the extent that it forecloses the use of intervening components between an output of the control means and

the “control input” of the converter. ‘103 Patent at Fig. 1. Second, requiring the language “input that receives the control signal generated by the control means” introduces redundancies and confusion (and renders other recited limitations ambiguous to the extent they conflict in meaning or superfluous to the extent that they are congruous in meaning). This language does not align with the plain language of the claims that separately requires the “control means...to generate digitally...a control signal for application to the control input of the converter.” Third, using words that are not used in the rest of the claim (*e.g.*, “voltage of the input analog signal”) introduces confusion and ambiguity, and improperly imports limitations into this definition to the extent that it requires that the control signal be a reference voltage without any “clear and unmistakable disavowal of claim scope” requiring such a limitation. *See* Sec. III.B.6

**6. “a control signal for application to the control input of the converter”—(JCCS Term 6 (Claims 1, 11))**

This term does not need to be construed. Nevertheless, PDIC offers a compromise construction in the event that the Court finds that it would be helpful to clarify that the control signal is “for application to the control input of the analog-to-digital converter.”

Defendants’ construction is flawed because it replaces the word “control” with “digital” and the phrase “for application to” with “applied to,” which narrows the claim scope so that the control signal must be a *digital* signal and the digital signal must be *applied to* the converter. These limitations are not required by the claim language, are contrary to the specification, and exclude a preferred embodiment shown in Figure 1 which illustrates that a control signal is converted to analog form by “digital to analogue converter 16” prior to application to the “converter 2.” Fig. 1. Defendants’ construction should be rejected.

Dated: August 29, 2013

By: /s/ R. Terry Parker

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**CERTIFICATE OF SERVICE**

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